Assignment 7

Textbook Assignment: "Oxygen System"; and "Oxygen Support Equipment." Pages 4-19 through 5-16.

Learning Objective: *Identify safety precautions, components, installation and testing of components, and operating procedures for liquid oxygen (LOX) systems. (This objective is continued from assignment 6.)*

7-1. What component in the MD type regulator protects it from overpressure?

1. Second stage relief valve
2. First stage relief valve
3. Venturi assembly
4. Aneroid check valve

7-2. Ambient air for mixing with oxygen passes through what component in an MD type regulator?

1. Demand valve assembly
2. Demand diaphragm chamber
3. Venturi assembly
4. Diluter aneroid assembly

7-3. What component in the MD type regulator prevents oxygen from flowing out through the inlet ports?

1. Demand valve assembly
2. Diluter aneroid assembly
3. Venturi assembly
4. Aneroid check valve

7-4. Pressure breathing above 30,000 feet is a feature of MD type pressure regulators. Which of the following is one of the components in the regulator that provides this feature?

1. Aneroid assembly
2. Demand valve assembly
3. Diluter aneroid assembly
4. Aneroid check valve assembly

7-5. Fire and/or explosion may result when even slight traces of combustible material come in contact with oxygen under pressure.

1. True
2. False

7-6. In making a functional check of the MD type regulator, a properly operating regulating will be indicated on the flow indicator in which of the following ways?

1. The indicator will show movement from the zero position-when inhaling
2. The indicator will show movement from the zero positiom when exhaling
3. The indicator will show white when inhaling and black exhaling
4. The indicator will show white when exhaling and black inhaling

7-7. When making a functional check of an oxygen system that uses the MD type regulator, what position must the emergency lever be in to check for oxygen supply through the regulator at ground level?

1. Emergency
2. 100-percent oxygen
3. Normal
4. ON

7-8. When making a functional check of an oxygen regulator, holding the emergency pressure control lever in the TEST MASK position produces which of the following results on the oxygen regulator panel?

1. The lamp will light
2. An increase in pressure on the pressure gauge
3. The flow indicator will go to the white position
4. Each of the above

7-9. What are the LOX converter's three sequences of operation?

1. Service, supply, and reservice
2. Fill, buildup, and supply
3. Reservice, supply, and buildup
4. Buildup, supply, and standby

IN ITEMS 7-10 THROUGH 7-14, SELECT FROM COLUMN B THE SEQUENCE OF LOX SYSTEM OPERATION THAT IS AUTOMATICALLY STARTED BY EACH ACTION/VALVE OPERATION LISTED IN COLUMN A. SEQUENCES OF OPERATION IN COLUMN B B MAY BE USED MORE THAN ONCE.

A. Actions/ Valves Operations	B. Sequence of Operations
7-10. The differential check valve opens	1. Fill
7-11. The trailer hose nozzle is removed from the converter	2. Buildup
7-12. The pressure opening valve unseats	3. Demand mode
7-13. The trailer hose nozzle is connected to the filler port	4. Supply-economy mode
7-14. When oxygen becomes available at the supply outlet	

7-15. When installing a section of tubing in an aircraft's oxygen system, which of the following items is permitted for use on the threads of the tubing connectioms prior to tightening?

1. Locktite
2. Waterproof grease
3. Antiseize tape
4. Thread compound

Learning Objective:
Identify the system components and operation of the onboard oxygen generating system (OBOGS).

7-16. Which of the following is an advantage of the OBOGS as compared to the LOX system?

1. An OBOGS requires no extensive depot-level maintenance
2. An OBOGS eliminates the need for daily servicing
3. An OBOGS requires no special transportation and storage equipment
4. Each of the above

7-17. Scheduled preventive maintenance occurs at what number of hours on the OBOGS?

1. 1,000 hours
2. 2,000 hours
3. 3,000 hours
4. 4,000 hours

7–18. Through which of the following components does the OB0GS receive engine bleed air?

1. Engine turbine
2. Heat exchanger
3. Cooling turbine
4. Ram air outlet

7-19. Which, if any, of the following elements is retained in the molecular sleeve beds as the airflow passes through them?

1. Oxygen
2. Nitrogen
3. Argon
4. None of the above

7-20. What component acts as a surge tank and an accumulator for the OBOGS?

1. Plenum
2. Reservoir
3. Heat exchanger
4. Oxygen monitor

Learning Objective:
Describe safety precautions and handling procedures for liquid oxygen (Lox) storage tanks, transfer lines, and valves.

7-21. LOX storage tanks consist of what components?

1. Single containers
2. High density containers
3. Outer and inner containers
4. Low density containers

7-22. The annular insulated space between containers of LOX storage tanks is vacuum pressurized.

1. True
2. False

7-23. Significant waste of LOX by the transfer hose/line is due to what factor?

1. Leaks
2. Cooldown
3. Improper connection
4. O-ring failure

7-24. Flexible metal hose under high pressure reacts in what manner?

1. It expands in length only
2. It expands in diameter only
3. It expands in length and diameter
4. It does not expand

7-25. LOX should never be trapped in a line between closed valves because of what occurrence?

1. The valves will freeze
2. The line will freeze
3. Excessive pressure can develop in the line
4. Pressure in the tank will bleed off

7-26. Which of the following components of a LOX storage system causes the most trouble?

1. Relief valve
2. Low temperature valve
3. Servicing hose
4. Rupture disc

7-27. Which of the following methods is most effective in insulating LOX valves?

1. Vacuum jacketing
2. Fiber glass insulation
3. Polyethylene foam insulation
4. Heater jacketing

Learning Objective:
Describe oxygen servicing equipment to include safety precautions, service trailers, and system servicing.

7-28. What should be the first aid provided if LOX is splashed on the skin?

1. Coat the area with petroleum jelly
2. Wrap the area with dry cloth
3. Wrap the area with damp cloth
4. Flush the area with water

7-29. Which of the following valves must be in the open position when a LOX oxygen trailer is not in use?

1. Buildup
2. Supply
3. Fill drain
4. Vent

7-30. In the LOX handling area, what is the safe distance permitted for smoking or open flames?

1. 25 feet
2. 50 feet
3. 75 feet
4. 100 feet

7-31. What is the major difference between the standard and the closed loop LOX trailers?

1. The closed loop trailer operates on a higher pressure
2. The closed loop trailer recaptures vented LOX losses
3. The standard trailer operates faster
4. The standard trailer is more economical

7-32. Which of the following safety hazards is eliminated by use of the closed loop LOX cart?

1. Venting oxygen
2. Trapped liquid in the lines
3. Static discharge
4. Overpressurization

7-33. The transfer tank of the closed loop LOX trailer has what capacity?

1. 15 liters
2. 25 liters
3. 50 liters
4. 65 liters

7-34. To what minimum number of microns is the 30-gallon storage tank of the closed loop LOX trailer evacuated?

1. 5
2. 7
3. 9
4. 11

7-35. What is the primary function of the 15-liter transfer tank?

1. To maintain system pressure
2. To hold small volumes of LOX for transfer
3. To maintain system temperature
4. To pressurize the 50 gallon storage tank

7-36. To transfer LOX to the converter, the transfer tank pressure must be in what relationship with the storage tank pressure?

1. Less than storage tank pressure
2. Greater than storage tank pressure only
3. Equal to storage tank pressure only
4. Greater than or equal to storage tank pressure

7-37. When using the closed loop LOX trailer, when the converter is full, the converter full indicator gauge displays what reading?

1. 5 liters
2. 10 liters
3. Full
4. Liquid

7-33. Which of the following gauges does not have green and red indicating bands?

1. The transfer tank pressure gauge
2. The storage tank pressure gauge
3. The storage tank liquid level gauge
4. The transfer tank liquid level gauge

7-39. Pressure in the storage tank of the closed loop LOX trailer must not exceed what pressure?

1. 55 psi
2. 65 psi
3. 75 psi
4. 85 psi

7-40. Under normal conditions, using a 30 psig transfer pressure, the TMU 70/M LOX trailer should fill in what maximum length of time?

1. 1 to 2 minutes
2. 5 to 10 minutes
3. 12 to 15 minutes
4. 20 to 30 minutes

7-41. You should never let the transfer tank pressure of the closed loop LOX trailer exceed what maximum pressure?

1. 30 psi
2. 50 psi
3. 70 psi
4. 90 psi

7-42. At what maintenance level are AMEs allowed to perform maintenance on LOX trailers?

1. Organizational
2. Intermediate
3. Depot
4. Both 2 and 3 above

7-40. If odors are discovered during an odor test, what procedure must be performed on the converter or LOX system?

1. It must be refilled and retested.
2. It must be sampled and tested by NADEF
3. It must be purged in accordance with existing directives
4. It must be wet cleaned and refilled

7-43. Which, if any, of the following fire-fighting agents is authorized for use on LOX enriched fires?

1. Soda acid
2. Methyl bromide
3. Carbon tetrachloride
4. None of the above

Learning Objectives:
Recognize contamination control procedures for oxygen equipment to include detection, purging, and purging equipment.

7-44. How often must an odor test be performed on a LOX trailer when it is not in use?

1. Every day
2. Every 3 days
3. Every 6 days
4. Every 9 days

7-45. How often must an odor test be performed on an aircraft oxygen system?

1. When painting has been performed on the aircraft
2. When odors are reported by the pilot or aircrew
3. When the aircraft oxygen system is found to have a leak
4. When a phase inspection is performed

7-46. How many milliliters of LOX is used to perform an odor test?

1. 100
2. 200
3. 300
4. 400

7-47. During an odor test, odors will be most prevalent under which of the following conditions?

1. While liquid is in the beaker
2. Fifteen to twenty minutes after the liquid has evaporated
3. Both 1 and 2 above
4. When the beaker has warmed to nearly room temperature

7-49. What is the most dangerous contaminant of LOX?

1. Water vapor
2. Nitrogen
3. Hydrocarbons
4. Inert solids

7-50. Which of the following is NOT a psychological effect of hydrocarbon contamination in LOX?

1. Uneasiness
2. Apprehension
3. Panic
4. Asphyxia

7-51. Which of the following is NOT a physiological effect of hydrocarbon contamination in LOX?

1. Panic
2. Nausea
3. Illness
4. Intoxication

7-52. Acetylene is the most hazardous hydrocarbon contaminant in LOX because of its ability to cause which of the following conditions?

1. Freezing of the lines
2. Internal corrosion of oxygen regulators
3. Both 1 and 2 above
4. It becomes its own source of ignition

7-53. Which of the following LOX contaminants will cause mechanical malfunctions of LOX system components?

1. Water vapor
2. Fibers
3. Nitrous oxide
4. Halogenated compounds

7-54. Base LOX storage tanks will be tested for odor a minimum of how often?

1. Every 7 days
2. Every 14 days
3. Every 21 days
4. Every 28 days

7-55. LOX samples are prepared for use by what organization?

1. The AME shop
2. The AIMD paraloft
3. The ground support equipment work center
4. The depot maintenance activity

7-56. The sampler, as received by the using activity, is sealed and contains gaseous oxygen at what pressure?

1. 5 psi
2. 10 psi
3. 15 psi
4. 20 psi

7-57. A LOX sampler received without a residual gaseous oxygen pressure should be given what treatment?

1. Purged before use
2. Wet cleaned and purged before use
3. Rejected and returned
4. Dried in an oven before use

7-58. What is the maximum number of ways to purge oxygen containers?

1. One
2. Two
3. Three
4. Four

7-59. What is the purpose of the LOX wash method of purging?

1. To purge LOX lines
2. To lower the contamination of LOX trailers
3. To purge gaseous oxygen cylinders
4. To lower the contamination of LOX converters

7-60. Aircraft LOX converters must, be purged under which of the following conditions?

1. Before putting them into service
2. If allowed to run dry
3. If odor is detected
4. Each of the above

7-61. The hot nitrogen gas used in purging LOX converters must be at what minimum temperature?

1. 100°F
2. 150°F
3. 200°F
4. 250°F

7-62. The hot nitrogen gas used in purging a LOX converter is regulated to what minimum pressure?

1. 30 psi
2. 40 psi
3. 50 psi
4. 60 psi

7-63. What is the minimum amount of time a converter should be purged?

1. One hour
2. Two hours
3. Three hours
4. Four hours

7–64. What should be the minimum temperature of the hot nitrogen exiting a converter being purged?

1. 50°F
2. 100°F
3. 150°F
4. 200°F

7-65. After a LOX converter has been purged and serviced, an odor test is performed. If odors persist, the converter must be subjected to what action?

1. Repurging
2. Turn into supply
3. Routing to NADEP
4. Wet cleaning

7-66. The gas purging set is designed to be used with which of the following gases?

1. Hydrogen
2. Nitrogen
3. Helium
4. Argon

7-67. Which of the following gases can be used with the gas purging set if water pumped gaseous nitrogen is not available?

1. Helium
2. Hydrogen
3. Oxygen
4. Argon

7-68. On the gas purging set, the high pressure relief valve relieves pressure in excess of what maximum pressure?

1. 3,550 psi
2. 3,600 psi
3. 3,675 psi
4. 3,750 psi

7-69. The high pressure gas from the gas supply cylinders is reduced to what pressure range?

1. 40 ±5 psi
2. 50 ±5 psi
3. 60 ±5 psi
4. 70 ±5 psi

7-70. Gas passing through the heater assembly is heated to what maximum temperature?

1. 165°F
2. 205°F
3. 255°F
4. 285°F

7-71. The gas exiting the filler valve of the gas purging set will be within what maximum temperature range?

1. 125 ±25°F
2. 225 ±25°F
3. 285 ±50°F
4. 325 ±50°F

7-72. A high temperature safety switch in incorporated in the system. It will break the electrical circuit to the heater assembly when heater assembly temperature exceeds what maximum temperature?

1. 175°F
2. 200°F
3. 250°F
4. 300°F